

REMARKS/ARGUMENTS

Status of the Claims

Prior to making this amendment, claims 1, 5-21, 24-28, and 34-42 were pending in this application. Claims 1, 11, 14, 24, 25, 28 40 and 42 have now been amended, claims 10, 15, 16 and 36 have been cancelled and new claim 43 and 44 have been added so that claims 1, 5-9, 11-14, 17-21, 24-28, and 34-44 are now presented for further examination.

The independent method claims 21 and 28 have both been amended to emphasize that a digital bit stream is encoded by phase modulation as mentioned in para [0022]. It is made clear that both reflecting states close the downhole end of the acoustic channel. Claim 28 recites some wording from claim 25 so as to indicate a source of the digital bit stream.

Apparatus claim 1 has been amended consistently with the amendment to the method claims. The structure to reflect with and without controlled shift of phase is brought in using language from claims 10 and 15. The feature of claim 36 has now been included in claim 1.

Amendment to dependent claims 11 24 and 25 is consequential. Claims 40 and 42 have been aligned with 24 as amended. Claim 14 has been amended to fix an error in its original form. New claims 43 and 44 refer to coiled tubing to provide the acoustic channel, as taught by para [0055].

No new matter is added by the amendments.

Rejection under 35 USC 102(e)

The Office Action rejected claims 1, 21 28 and a number of the dependent claims under 35 USC 102(e) over Dubinsky US 6757218.

The Examiner's detailed discussion of arguments is appreciated and has been carefully considered. Applicant believes that the independent claims as now amended are novel for the following reasons.

Dubinsky Fig 4b shows an arrangement down hole in which the flap is movable between two positions 426a and 426b. In position 426b the acoustic channel is closed at the bottom and there is reflection. In position 426a the acoustic channel is open at the bottom and there is little or no reflection. This understanding of Dubinsky is as stated near the bottom of page 7 of the Office Action. By contrast the amendment to claims 1, 21 and 28 requires that the acoustic channel is closed at the bottom, in both states of the reflecting terminal. This gives novelty over Dubinsky.

This structural difference is consistent with the operational difference from Dubinsky. Dubinsky relies on the difference between reflection (by 426b) and little or no reflection (426a) to apply amplitude modulation to the acoustic wave returning to the surface. Dubinsky refers to this at column 3 line 6 as a bi-level signal. Multi-level is also contemplated. Both are amplitude modulation and the word amplitude is seen at column 5 line 22. As noted by the Office Action, Dubinsky recognizes that there may be fortuitous alteration of phase but there is no teaching to make use of this.

Claims 21 and 28 now explicitly require that a digital bit stream is encoded as phase modulation and also detected as phase modulation at the surface. Such encoding as phase modulation is not taught nor suggested by Dubinsky. Claim 1 calls for sensors able to perform such detection.

Claim 1 also requires a valve and resonator operable so that the valve is either closing the acoustic channel or opening the channel to communicate with the resonator which is then the closure of the channel. Such a construction is nowhere taught or suggested by Dubinsky.

On page 9 of the Action the examiner points out that Dubinsky shows a resonator and valve. However, Dubinsky does not show an arrangement as now required where the resonator is either open or closed to the acoustic channel, but the channel is closed by the resonator when the resonator is open to the channel.

Claim 1 also distinguishes from Dubinsky by requiring a continuous carrier wave signal. This distinguishes from Dubinsky's teaching at column 5 line 8 to use a source signal which is pulses.

So, Applicants submit that the features of the amended claims referred to above give novelty over Dubinsky and respectfully request that the rejections under 35 USC are withdrawn.

Rejection under 35 USC 103(a)

Claims 9, 13, 26, 27, 36, 37, 39 and 41 stands rejected as obvious over Dubinsky alone. These rejections are of course predicated on the novelty rejection discussed above. It is respectfully submitted that the arguments stated in the Action are viewing the features concerned with hindsight, because nothing is put forward to lead onwards from Dubinsky to these additional features.

Claims 18, 19 and 34 stand rejected over a combination of Dubinsky and Karl. This rejection is also predicted on the novelty rejection, as argued against above. Applicants submit that it should be moot, because the independent claims are novel

For the reasons given above applicants believe that the dependent claims are non-obvious over the cited documents. It is requested that the rejections under 35 USC 103 are withdrawn. Applicants have chosen to discuss some dependent claims. No admission is made or implied concerning the remaining dependent claims.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

In the event that a fee or refund is due in connection with this Amendment, the Commissioner is hereby authorized to charge any underpayment or credit any overpayment to Deposit Account No 19-0615. If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned.

Respectfully submitted,

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Date: March 23, 2011
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